

US006344752B1

(12) United States Patent

Hagihara et al.

(10) Patent No.:

US 6,344,752 B1

(45) Date of Patent:

Feb. 5, 2002

(54) CONTACTOR AND PRODUCTION METHOD FOR CONTRACTOR

(75) Inventors: Junichi Hagihara, Sendai; Shinji Iino, Kitakoma-gun, both of (JP)

(73) Assignee: Tokyo Electron Limited, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

U.S.C. 134(b) by 0 days

(21) Appl. No.: 09/509,546

(22) PCT Filed: Jul. 29, 1999

(86) PCT No.: PCT/JP99/04090

§ 371 Date: Apr. 12, 2000

§ 102(e) Date: Apr. 12, 2000

(87) PCT Pub. No.: WO00/10016

PCT Pub. Date: Feb. 24, 2000

(30) Foreign Application Priority Data

(51)	Int. Ci. ⁷			G 0:	LR 31/02
_		` '	•••••••••••••••••••••••••••••••••••••••		

(56) References Cited

U.S. PATENT DOCUMENTS

5,177,438 A	 1/1993 	Littlebury et al.	324/754
5,476,211 A	12/1995	Khandros	
5,625,298 A	4/1997	Hirano et al.	

			•
5,811,982 A	*	9/1998	Beaman et al 324/762
5,828,226 A		10/1998	Higgins èt al.
5,832,601 A		11/1998	Eldridge et al.
6,218,203 B	i *	4/2001	Khoury et al 438/15

FOREIGN PATENT DOCUMENTS

JP	7-283280	10/1995
JP	8-50146	2/1996
JP	9-148389	6/1997
JP	11-133062	5/1999
IP	11-145172	5/1999

^{*} cited by examiner

Primary Examiner—Ernest Karlsen Assistant Examiner—Minh N. Tang

(74) Attorney, Agent, or Firm—Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

(57) ABSTRACT

A conventional probe card is very complex in a support structure of probe terminals and it has been difficult to change an array of the probe terminals correspondingly to various arrays of electrode pads of an object to be checked. A contactor (1) of the present invention simultaneously sets its probe terminals in contact with a plurality of electrode pads of an object to be checked and electrical checking of the object is made once or a plurality of times. It has a plurality of first electrodes (3) arranged on a first substrate (silicon substrate) (2) and probe terminals (4) respectively provided on these electrodes (3). The probe terminal (4) has a conductive support (7) provided on the first electrode, elastic support plate (8) whose one end is fixed to the upper end of the conductive support column (7), and probe terminal (bump) 9 fixed to the free end portion of the elastic support plate (8).

21 Claims, 8 Drawing Sheets

